

NICE GUIDELINES

Reducing the risk of venous thromboembolism (deep vein thrombosis and pulmonary embolism) in inpatients having surgery: summary of NICE guidance

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EDITORIAL

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Why read this summary?

Deep vein thrombosis occurs in over 20% of patients having major surgery and over 40% of patients having major orthopaedic surgery. The postoperative risk of pulmonary embolism can be as high as 5% in the highest risk groups. However, many patients are probably not currently receiving adequate prophylactic measures.^{1 2} This article summarises the most recent guidance from the National Institute for Health and Clinical Excellence (NICE) on how to reduce the risk of venous thromboembolism in inpatients having surgery.³

Recommendations

NICE recommendations are based on systematic reviews of best available evidence. When minimal evidence is available, a range of consensus techniques is used to develop recommendations. In this summary, recommendations derived primarily from consensus techniques are indicated with an asterisk (*).

Assess patients for risk factors

Assess patients for the following risk factors, and inform all patients of the risks of venous thromboembolism and the effectiveness of prophylaxis.

- Age over 60 years
- Obesity (body mass index ≥ 30)
- Continuous travel of more than three hours during the four weeks before or after surgery
- Immobility (for example, paralysis or limb in plaster)
- Personal or family history of venous thromboembolism
- Varicose veins with associated phlebitis
- Active cancer or cancer treatment
- Active heart or respiratory failure
- Severe infection
- Acute medical illness
- Recent myocardial infarction or stroke
- Inflammatory bowel disease (for example, Crohn's disease and ulcerative colitis)
- Use of oral contraceptives or hormonal replacement therapy
- Pregnancy or puerperium

- Certain specific haematological or systemic causes of prothrombotic state (such as antiphospholipid syndrome, Behçet's disease, central venous catheter in situ, inherited thrombophilias, myeloproliferative diseases, nephrotic syndrome, paraproteinaemia, paroxysmal nocturnal haemoglobinuria).

General prevention of venous thromboembolism

- Offer all surgical inpatients a mechanical method of prophylaxis (graduated compression or antiembolism stockings, intermittent pneumatic compression, or foot impulse devices) except where contraindicated (for example, do not offer graduated compression stockings to patients with peripheral arterial disease or diabetic neuropathy).
- Offer both mechanical prophylaxis and low molecular weight heparin to all inpatients having orthopaedic surgery (and inpatients having other surgery who have one or more of the risk factors listed above). Fondaparinux, within its licensed indications, may be used as an alternative to low molecular weight heparin.
- Offer thigh length stockings (worn until usual level of mobility), but knee length stockings may be used to improve compliance or fit. The compression should be about 18 mm Hg at the ankle, 14 mm Hg at the mid-calf, and 8 mm Hg at the upper thigh.
- Healthcare professionals trained in the use of compression stockings should show patients how to wear them correctly. Monitor use and provide help if necessary.*
- Consider regional instead of general anaesthesia. If regional anaesthesia is used, plan the timing of pharmacological prophylaxis carefully to minimise the risk of haematoma.
- Encourage patients to become mobile as soon as possible after surgery and to do leg exercises if immobile.*
- Ensure the patient does not become dehydrated.*
- Consider risks and benefits of stopping pre-existing established anticoagulation or antiplatelet therapy before surgery.*

This is the first in a series of BMJ summaries of new NICE guidelines, which are based on the best available evidence; they will highlight important recommendations for clinical practice, especially where uncertainty or controversy exists

Prevention for specific types of inpatient surgery

| Type of surgery | Patient has no risk factors | Patient has ≥ 1 risk factors |
|---|--|--|
| Hip replacement | Mechanical prophylaxis plus LMWH or fondaparinux | Mechanical prophylaxis plus LMWH or fondaparinux (continue for four weeks) |
| Hip fracture | Mechanical prophylaxis plus LMWH or fondaparinux (continue for four weeks) | Mechanical prophylaxis plus LMWH or fondaparinux (continue for four weeks) |
| Other orthopaedic | Mechanical prophylaxis plus LMWH or fondaparinux | Mechanical prophylaxis plus LMWH or fondaparinux |
| Cardiac | Mechanical prophylaxis | Mechanical prophylaxis plus LMWH (if no other anticoagulants used) |
| General | Mechanical prophylaxis | Mechanical prophylaxis plus LMWH or fondaparinux |
| Gynaecological (excluding caesarean) | Mechanical prophylaxis | Mechanical prophylaxis plus LMWH |
| Neurosurgery (including spinal surgery) | Mechanical prophylaxis | Mechanical prophylaxis plus LMWH (except patients with ruptured cranial or spinal vascular malformations if the lesion has not been secured) |
| Thoracic | Mechanical prophylaxis | Mechanical prophylaxis plus LMWH |
| Urological | Mechanical prophylaxis | Mechanical prophylaxis plus LMWH |
| Vascular | Mechanical prophylaxis | Mechanical prophylaxis plus LMWH |

LMWH=low molecular weight heparin.

Advice to patients

- Warn patients that the immobility associated with continuous travel of more than three hours in the four weeks before or after surgery may increase the risk of venous thromboembolism.*
- Advise patients to consider stopping combined oral contraception four weeks before elective surgery.
- Give patients (as part of their discharge plan) oral and written information on the signs and symptoms of deep vein thrombosis and pulmonary embolism, the correct use of prophylaxis at home, and the implications of not using the prophylaxis correctly.*

Specific strategies

For recommended prevention strategies for specific types of inpatient surgery, see the table.

Overcoming barriers

Some clinicians hold strong views about the overall benefits of reducing the risk of deep vein thrombosis or pulmonary embolism with drugs that increase the risk of bleeding. The balance of risks cannot be quantified from clinical experience, and moreover, a recent

adverse experience tends to affect objective consideration.⁴ The highly valued concept of clinical judgment conflicts with recognition that adherence to an evidence based guideline may be safer for doctors as well as for patients.

NICE has developed tools to help organisations implement the guidance (see www.nice.org.uk/page.aspx?o=tools). Further information about the guidance is available on bmj.com.

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- 2 Kakkar AK, Davidson BL, Haas SK, the Investigators Against Thromboembolism (INATE) Core Group. Compliance with recommended prophylaxis for venous thromboembolism: improving the use and rate of uptake of clinical practice guidelines. *J Thromb Haemost* 2004;2:221-7.
- 3 National Institute for Health and Clinical Excellence. *Reducing the risk of venous thromboembolism (deep vein thrombosis and pulmonary embolism) in inpatients undergoing surgery*. 2007. (NICE clinical guideline No. 46.) www.nice.org.uk/CG046.
- 4 Choudhry NK, Anderson GM, Laupacis A, Ross-Degnan D, Normand SL, Soumerai SB. Impact of adverse events on prescribing warfarin in patients with atrial fibrillation: matched pair analysis. *BMJ* 2006;332:141-5.

Commentary: NICE—setting clinical standards

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The clinical guidelines programme of the National Institute for Health and Clinical Excellence (NICE) is arguably the largest in the world and is unique in considering both cost effectiveness as well as clinical effectiveness. This article by Hill and Treasure is the first in a series to be published in the *BMJ*: each article will give a short account of key features of newly published NICE guidelines. The articles will particularly focus on areas where changes in current practice are recommended.

NICE guidelines are produced by an independent guideline development group. Its members include

relevant clinicians, experts in areas such as systematic reviews and health economics, as well as at least two patients or carers. The development process is based on an internationally agreed methodology (box),^{1 2} and NICE has now published almost 50 clinical guidelines. In a recent survey, NICE's guideline on schizophrenia achieved a higher total score (and by a wide margin) on all internationally agreed elements of guideline development¹ than any of the 26 other international guidelines on the same topic.³

There is no point, though, in developing clinical